

## CLAIMS

What is Claimed:

1. A method for inducing an immune response in an animal, comprising:
  - a) providing a composition comprising a polynucleotide encoding at least an immunogenic portion of a lung carcinoma polynucleotide wherein the polynucleotide has at least 90%identity with SEQ ID NO:347;
  - b) administering said polynucleotide; and
  - c) thereby inducing an immune response in an animal.
2. The method of claim 1, wherein said composition further comprises a component selected from the group consisting of a physiologically acceptable carrier or an adjuvant.
3. A method according to claim 1, wherein the lung carcinoma polynucleotide is delivered by a viral based delivery system.
4. A method according to claim 3, wherein the viral based delivery system is an adenovirus.
5. The method of claim 1, wherein the immune response induced is a CD4+ T helper response.
6. The method of claim 1, wherein the immune response induced is a CD8+ cytotoxic T lymphocyte response.
7. The method of claim 1, wherein the immune response induced is both a CD4+ T helper and CD8+ cytotoxic T cell immune response.

8. An isolated polynucleotide comprising a sequence selected from the group consisting of:

- (a) sequences provided in SEQ ID NO:351, 353, 358, 362, 364, 366, 368, 370-375, 420, 424, 428, 431, 434, 442, 447, 450 and 467;
- (b) complements of the sequences provided in SEQ ID NO:351, 353, 358, 362, 364, 366, 368, 370-375, 420, 424, 428, 431, 434, 442, 447, 450 and 467;
- (c) sequences consisting of at least 10 contiguous residues of a sequence provided in SEQ ID NO:351, 353, 358, 362, 364, 366, 368, 370-375, 420, 424, 428, 431, 434, 442, 447, 450 and 467;
- (d) sequences that hybridize to a sequence provided in SEQ ID NO:351, 353, 358, 362, 364, 366, 368, 370-375, 420, 424, 428, 431, 434, 442, 447, 450 and 467, under highly stringent conditions;
- (e) sequences having at least 75% identity to a sequence of SEQ ID NO:351, 353, 358, 362, 364, 366, 368, 370-375, 420, 424, 428, 431, 434, 442, 447, 450 and 467;
- (f) sequences having at least 90% identity to a sequence of SEQ ID NO:351, 353, 358, 362, 364, 366, 368, 370-375, 420, 424, 428, 431, 434, 442, 447, 450 and 467; and
- (g) degenerate variants of a sequence provided in SEQ ID NO:351, 353, 358, 362, 364, 366, 368, 370-375, 420, 424, 428, 431, 434, 442, 447, 450 and 467.

9. An isolated polypeptide comprising an amino acid sequence selected from the group consisting of:

- (a) sequences having at least 90% identity to a polypeptide having an amino acid sequence of any one of the sequences provided in SEQ ID NO:352, 354, 357, 361, 363, 365, 367, 369, 376-382, 387-419, 423, 427, 430, 433, 441, 443, 446, 449, 451-466 and 468-469;
- (b) sequences encoded by a polynucleotide of claim 8;
- (c) sequences having at least 70% identity to a sequence encoded by a polynucleotide of claim 8; and
- (d) sequences having at least 90% identity to a sequence encoded by a polynucleotide of claim 8.

10. An expression vector comprising a polynucleotide of claim 8 operably linked to an expression control sequence.

11. A host cell transformed or transfected with an expression vector according to claim 10.

12. An isolated antibody, or antigen-binding fragment thereof, that specifically binds to a polypeptide of claim 9.

13. A method for detecting the presence of a cancer in a patient, comprising the steps of:

- (a) obtaining a biological sample from the patient;
- (b) contacting the biological sample with a binding agent that binds to a polypeptide of claim 9;
- (c) detecting in the sample an amount of polypeptide that binds to the binding agent; and
- (d) comparing the amount of polypeptide to a predetermined cut-off value and therefrom determining the presence of a cancer in the patient.

14. A fusion protein comprising at least one polypeptide according to claim 9.

15. A fusion protein according to claim 14, wherein the fusion protein is selected from the group consisting sequences provided in SEQ ID NO:352, 354, 423, 427, 430 and 433.

16. An oligonucleotide that hybridizes to a sequence recited in SEQ ID NO:351, 353, 358, 362, 364, 366, 368, 370-375, 420, 424, 428, 431, 434, 442, 447, 450 and 467 under highly stringent conditions.

17. A method for stimulating and/or expanding T cells specific for a tumor protein, comprising contacting T cells with at least one component selected from the group consisting of:

- (a) polypeptides according to claim 9;
- (b) polynucleotides according to claim 8; and
- (c) antigen-presenting cells that express a polynucleotide according to claim

8,

under conditions and for a time sufficient to permit the stimulation and/or expansion of T cells.

18. An isolated T cell population, comprising T cells prepared according to the method of claim 17.

19. A composition comprising a first component selected from the group consisting of physiologically acceptable carriers and immunostimulants, and a second component selected from the group consisting of:

- (a) polypeptides according to claim 9;
- (b) polynucleotides according to claim 8;
- (c) antibodies according to claim 12;
- (d) fusion proteins according to claim 14;
- (e) T cell populations according to claim 18; and
- (f) antigen presenting cells that express a polypeptide according to claim 9.

20. A method for stimulating an immune response in a patient, comprising administering to the patient a composition of claim 19.

21. A method for the treatment of a lung cancer in a patient, comprising administering to the patient a composition of claim 19.

22. A method for determining the presence of a cancer in a patient, comprising the steps of:

- (a) obtaining a biological sample from the patient;
- (b) contacting the biological sample with an oligonucleotide according to claim 9;
- (c) detecting in the sample an amount of a polynucleotide that hybridizes to the oligonucleotide; and
- (d) compare the amount of polynucleotide that hybridizes to the oligonucleotide to a predetermined cut-off value, and therefrom determining the presence of the cancer in the patient.

23. A diagnostic kit comprising at least one oligonucleotide according to claim 16.

24. A diagnostic kit comprising at least one antibody according to claim 12 and a detection reagent, wherein the detection reagent comprises a reporter group.

25. A method for the treatment of lung cancer in a patient, comprising the steps of:

- (a) incubating CD4+ and/or CD8+ T cells isolated from a patient with at least one component selected from the group consisting of: (i) polypeptides according to claim 9; (ii) polynucleotides according to claim 8; and (iii) antigen presenting cells that express a polypeptide of claim 9, such that T cell proliferate;
- (b) administering to the patient an effective amount of the proliferated T cells, and thereby inhibiting the development of a cancer in the patient.